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AMC Pamphlet
AMC 385-79

SAFETY DIGEST

SEPTEMBER 1967

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HEADQUARTERS
UNITED STATES ARMY MATERIEL COMMAND
WASHINGTON, D.C. 20315

AMC Pamphlet 385-79 SEPTEMBER 1967

The Safety Digest is an AMC Pamphlet prepared by the Safety Division, Headquarters, U. S. Army Materiel Command. Its purpose is to disseminate information which can materially influence and improve safety programs at all Command establishments.

Articles are included to supplement technical knowledge as well as practical knowledge gained through experience. They provide a basis for the further refinement of safety measures already incorporated in operating procedures and process layout. To achieve maximum effectiveness, the Safety Digest should be given widespread circulation at each AMC establishment.

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Unclassified material believed to be of interest or benefit to other establishments is welcome for publication in the Safety Digest. Please send articles for review to: U. S. Army Materiel Command Field Safety Agency, Charlestown, Indiana. If possible, include pictures, charts, drawings, and illustrations that clarify and heighten interest in your presentation.

(AMCAD-S)

*FOR THE COMMANDER:

CLARENCE J. LANG
Major General, USA
Chief of Staff

OFFICIAL:

STANLEY J. SAWICKI
Colonel, GS
Chief, Administrative Office

Special Distribution

IN THIS ISSUE

FOREWORD I
IN THIS ISSUE II

NEW CUMBERLAND ARMY DEPOT PROMOTES DRIVING SAFETY 1
RAILROAD ACCIDENTS ON THE AMC LINES 3
LET'S KEEP OUR FINGERS INTACT 6
A HAZARDOUS MATERIAL INDEX 10
SHARPE SAFELY SPEEDS LOADING 12
FORKLIFT TRUCK OVERHEAD GUARDS FOR LOW CLEARANCES 14
PINCH POINT SHIELDED 15
SAFETY HARNESS PROTECTS STUDENT CLIMBERS 16

CURRENT EVENTS
- CLIMB ON TRACTOR TRIGGERS EXPLOSION 17
- CORD CONNECTION MAKES WRONG CONNECTION 18
- STEPPED UP ACTION LED TO EXPLOSION 19
- RUSH THAT GUARD INSTALLATION! 20
- A WARMING WARHEAD BELCHED 21

SEAT BELTS AND DAMAGES COLLECTION 22
HERE'S TO YOUR GOOD HEALTH 23
RADIOACTIVE TABS HELP TO LOCATE TEST MUNITIONS 25
GOOD DRIVER LABEL REQUIRED ON ARMY MOTOR VEHICLES 25
SAFETY GLASSES SAVE EYE 26
SAFETY SHOE PREVENTS INJURY 26

EXPLOSIVES SAFETY
- THE NEW EMPLOYEE AND EXPLOSIVES 27
- METAL FORMING WITH EXPLOSIVES 30
- RECOGNITION OF PROPELLANT HEAT SOURCES 33

DO YOU KNOW? 35
REFERENCE PUBLICATIONS 37
WELL, DID YOU KNOW? 39
LETTERKENNY ARMY DEPOT RECEIVES SAFETY AWARD 40
NATIONAL SAFETY COUNCIL AWARD NOTIFICATIONS 40

KNOW YOUR FIRE EXTINGUISHERS . . . . . INSIDE REAR COVER
REVISED FIRE EXTINGUISHER CHART . . . . . INSIDE REAR COVER
CHINOOK HELICOPTER . . . . . FRONT, INSIDE FRONT AND REAR COVERS

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NEW CUMBERLAND ARMY DEPOT PROMOTES DRIVING SAFETY

New Cumberland Army Depot recognized and made maximum use of a many-sided opportunity to promote safer driving by its personnel and its neighbors. The opportunity was offered by the proximity of the Depot's 20 May Armed Forces Day "Report to the Nation" reception for the public, and the 23 May National Safety Council's National Drivers Test broadcast. Both closely preceded Memorial Day, the first big public holiday of the 1967 warm weather season.

Steps taken to promote safe driving included the following:

1. It was determined that the National Drivers Test would be broadcast by the television station that served the area.

2. Arrangements were worked out with the television station, Channel 21, WHP-TV, Harrisburg, Pennsylvania, to cooperate with the installation's program for encouraging people to watch the program and to take the drivers test. The station provided a booth at the Depot's Armed Forces Day display. The booth was manned by Advertising Department personnel who distributed test score sheets.

3. An ample supply of the test score sheets was obtained from the oil company that sponsored the National Drivers Test.

4. Score sheets were distributed to all employees of the Depot, its attached activities, its satellite activities and residents in its quarters.

5. The National Drivers Test was announced in the New Cumberland Army Depot Daily Bulletin. All employees were urged to take the test and to telephone their scores to the Safety Office.

6. Nearby Letterkenny Army Depot was invited to join in the score reporting program. (The overall Letterkenny Army Depot average of reported scores was 80 versus the 79 average of New Cumberland Army Depot personnel. The male and female personnel of both depots had better scores than the national averages reported on the television program.)

7. The New Cumberland Army Depot Safety Director secured the help of the Pennsylvania State Police and the Bureau of Traffic Safety to help promote the National Drivers Test at the Depot on Armed Forces Day.

8. The State Police furnished a display of rescue equipment and enforcement tools used to protect the driving public. These included demonstrations on the use of radar and the intoximeter.

9. The Bureau of Traffic Safety furnished a booth and handed out safe driving promotional pamphlets. They a also provided a display board of photographs showing fatal traffic accidents. These photographs had a great impact on the visiting public.

10. The Depot's Armed Forces Day hostesses also handed out score sheets to the visitors.

11. The Safety Office obtained the loan of 2 wrecked automobiles to use for display and promotional purposes.

The program was considered extremely successful. An estimated crowd of over 14,000 visitors viewed the New Cumberland Army Depot, its exhibits and the performance of a U.S. Army Special Forces Team. The safe driving message was received by all the visitors and the installation's personnel. They all departed knowing they could learn more about safe driving by watching the National Drivers Test.

Representatives of the Army and television joined in promoting the National Drivers Test at the New Cumberland Army Depot Armed Forces Day program. Shown are Miss Billie Pananas of station WHP-TV, Harrisburg, Pennsylvania; LT Peter Doley, U.S. Army Special Forces 'A' Detachment of Green Berets; and Norman Smith, Depot Safety Director.

Members of the visiting public at the New Cumberland Army Depot are shown receiving an orientation lecture on highway safety from SGT J. C. Hileman, Pennsylvania State Police.

RAILROAD ACCIDENTS ON THE AMC LINES

The average person may never see a railroad accident, except in news pictures or on a television screen. The operating and safety personnel at one busy Army Materiel Command installation may wish they were so fortunate. Here in brief is the installation's record of railroad accidents in a little over 4 months in FY 1967.

1. A railroad conductor failed to set the hand brakes when 4 dinkey powder cars were spotted on a spur line track. A short time later the 4 cars rolled toward the main line, and one collided with a moving locomotive. Damage was estimated at $675.

2. Four days later one locomotive was being pulled out of a repair shop by another. A diesel mechanic riding on the steps of the towed locomotive reached out and pushed the "close" button on the electrically operated overhead door. The door began to descend and was struck by the locomotive's exhaust stack. Damage amounted to $220.

3. Five days later a railroad conductor slipped while he was trying to board a moving dinkey powder car. A wheel ran over his right foot, and lacerated and fractured toes caused him to miss work for 2 weeks.

4. Two months passed without a reportable railroad accident. Then 2 dinkey cars pushed by a locomotive collided with a loaded powder car that had been spotted on the main line. The conductor had signaled the engineer to stop to permit coupling to the spotted car. Grease on the rail lengthened the stopping distance. The load in the car shifted and pushed out the end. The cost of the damage was $696.

5. A week later 3 empty powder cars were being pushed along a track by a locomotive. The conductor riding in the lead car failed to see a loaded powder car ahead in time to signal the engineer to a stop. Total damage caused by the 2 cars by the collision was $2,792. It was found that the loaded car had been spotted temporarily on the main track by another train crew.

6. Six weeks later a locomotive was pushing a loaded acid car in an acid area. A latch that held a catwalk upright failed to function properly. The catwalk fell and struck the cab of the moving locomotive. A window was broken and the frame of the cab was bent on one side. Damage to the catwalk and locomotive was estimated to be $683.

Though they did not equal the record of this installation's accident-plagued railroad, other AMC installations have had their share of trouble. In FY 1967, 3 additional installations reported 3 accidents each involving their railroad operations. These are examples of their experiences:

1. At one installation a locomotive ran through a door when the engineer started the motor after failing to move the throttle into neutral and set the emergency brake. His employment was terminated.

2. At a depot one locomotive bumped head-on into another locomotive.

3. At another depot a locomotive overtook and struck a train of maintenance cars that was moving down the track ahead of it. (See Photo 1.)

4. Sparks from locomotives started timberland fires at 2 installations.

5. A boxcar was pushed through a closed gate when the engineer was slow in seeing and responding to signals given by members of his crew. The engineer had been busy changing his seat to face the direction in which his train was moving.

Although less than 3 percent of AMC's FY 1967 accidents involved railroad operations, most of these were accidents which could easily have been prevented. Here are simple actions that should have prevented most of them.

1. Operators of railroad equipment should remain alert to the situation on the track ahead of and behind them. This seems elementary, but lack of sufficient alertness obviously helped cause some of the accidents mentioned above. Inattention by locomotive engineers and conductors has and can cause collisions that involve AMC railroad equipment.

2. Railroad operating personnel should comply with their standing operating procedures. This applies to all procedures, from starting a locomotive to setting brakes on spotted cars. Disregarded instructions will eventually be followed by accidents.

3. Adequate procedures should be established for controlling the spotting of unattended cars on main lines where they may be encountered by the unwarned crews of other trains.

4. Flares, signals, and flagmen should be put out as necessary to provide warning of cars and equipment spotted where they may block traffic.

5. All operating personnel should receive adequate training in the procedures and rules they will be required to obey.

6. Personnel should be indoctrinated in the fact that safe practices in other activities should be transferred to their railroad work. The railway engineer who is alert to the road ahead and behind him when driving his automobile should not abandon the practice of alertness when he starts to drive a locomotive.

7. Tracks and rolling stock should be properly maintained. The cost of replacing a worn or defective switch point or a worn wheel flange is usually far less than that of getting a derailed train back on the track and repairing the damage it has caused.

8. Screens should be maintained in a state that will prevent locomotives from throwing off hot carbon sparks that may start forest fires.

9. Signs, warning devices, signalmen, and training should be used as needed to prevent collisions of motor vehicles with trains. The trains on AMC installations are usually slow moving. Motor vehicle operators who are alert should be able to avoid collisions with them.

10. Installation safety directors should assist supervisory personnel in reviewing the adequateness of railroad training and operating procedures.

These and other practical actions they may suggest should add to the safety of railroad operations at your installation.

Photo 1

Picture shows damage to a railroad maintenance car train by an Army locomotive pushing a boxcar.

Photo 2

Spreading rails caused the derailment of the engine.

LET'S KEEP OUR FINGERS INTACT

The industrial safety movement began with efforts to eliminate physical hazards to the worker through machine guarding. The man was protected from the machine by a variety of guarding devices that prevented him from coming into contact with moving parts that might inflict injury, mutilation, or death. Protective body wear provided further protection. The overall success of the guarding effort is reflected in the low frequency rates of American industry.

In its safety program the Army Materiel Command, one of the largest manufacturing and supply organizations in the United States, emphasizes the protection of its workers from injuries by its machines and materials. As a means of identifying all phases of its safety experience, the AMC accident data is compiled monthly in the Statistical Summary and forwarded for review, and action by AMC Commanders.

From time to time, certain "causes" and "types" of injuries cause concern. Presently, "caught in/on/between" as a cause of injury, and "amputations" as types of injuries have trended upward. While other types of injuries, such as fractures, lacerations, and bruises can be caused by the caught in/on/between accidents, they can also result from other causes, such as falls and motor vehicle accidents. Amputation, most often of one or more fingers, almost always involves the body part being caught in/on/between.

A current upward trend for caught in/on/between as a cause of AMC injuries is reflected in the following table.

	Total Injuries Of All Types	Total Caught In/On/ Between Injuries	Per Cent of All AMC Injuries
FY 1967	761	107	14.1
FY 1966	619	66	10.7
FY 1965	807	72	8.9
FY 1964	866	81	9.4
11 Mos, FY 1963	873	86	9.9

An upward trend in amputation cases is shown by the following table:

	Total Amputations	Hands and Fingers As Part Amputated	Amputations As Percentage Of All AMC Injuries
FY 1967	62	59	8.1
FY 1966	32	31	5.2
FY 1965	29	25	3.6
FY 1964	42	39	4.8
11 Mos, FY 1963	33	29	3.8

These two tables disclose the following information:

1. Caught in/on/between is now growing in importance as a cause of injury to AMC personnel.

2. Hands and fingers are the body part most likely to be caught.

3. Amputations are growing in importance as an injury type. The percentage has doubled in the last five years.

4. Vigorous and effective action is required to reverse the upward trends of caugnt in/on/between and amputation accidents.

The following summary of randomly selected amputation cases suggests how unnecessary it was for these accident victims to be mutilated:

1. "Male Civilian: Tip of left middle finger caught between propellant grain and trimmer. Machine inadequately guarded. Unauthorized use of trimmer machine."

2. "Male Civilian: Accidentally touched hot manifold of forklift and jerked hand into fan. Two fingers amputated. Working on forklift while motor was running."

3. "Female Civilian: Fifth finger, left hand. New employee, attempting to tighten chuck jaws on gun tube machine without completely locking machine, had fingers caught when machine started to rotate."

4. "Male Civilian: New, inexperienced employee was operating a grommet machine. Design of machine required operator to hold material near the point of operation. The worker placed his thumb at the point of operation. End of thumb was amputated."

Recognition of a number of facts and initiation of action based upon the knowledge will prevent most caught in/on/between and amputation accidents. Here are some of the key facts that must be recognized:

1. If a machine is used with its moving parts unguarded, an injury producing accident will eventually occur.

2. Certain machinery parts are inherently hazardous to the worker. Moving saw blades, gears, shearing blades and fan belts are familiar examples.

3. Operators of machines cannot be relied upon to avoid contact with exposed hazardous parts. Eventually some part of their body or clothing will come into contact with the exposed moving part.

4. For the worker to be safe, he must be protected from the danger point on the machine, either through the way the item is constructed or by secure guarding.

5. If a machine is dangerous in any respect, it must not be operated until it has been made safe by modification or guarding.

6. There is a need for more universal acceptance of machine safeguarding.

7. There is a need for more foresight in procuring machines that have guards that are built on or as an integral part. The alternative to this foresight is the addition of guards that may provide a makeshift correction to hazardous conditions.

8. The worker who operates the machine must be trained to use its guards. The guards are useless if the worker fails to use them.

9. Protective clothing is often required to protect the worker from the machine or from his work environment.

➔ The benefit from the known facts comes through vigorous and continuing effort. Here are the people involved in

keeping intact the fingers of John Doe, worker.

1. Top management in the form of the Commanding Officer or Plant Manager must want and require effective action to keep John Doe working without injury.

2. The engineer must design or request the procurement of safe, guarded machinery. To make certain it is safe he will need to avail himself of the knowledge of supervisors, safety personnel and experienced workers.

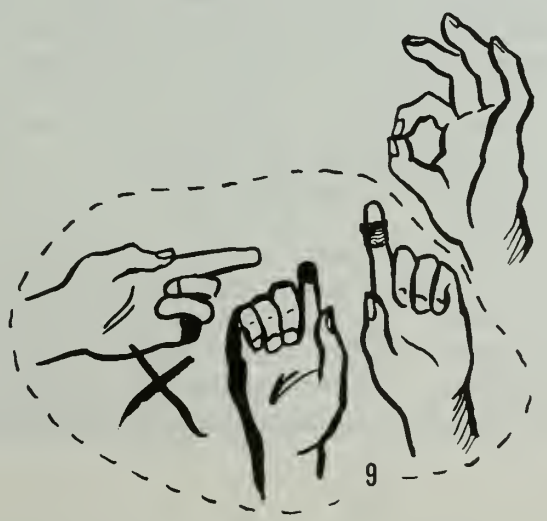
3. The supervisor must train the worker to operate the machine safely and to use the guards. This will require the use of appropriate standing operating procedures and protective clothing and equipment wherever these are needed. Safety shoes prevent an untold but certainly large number of amputated, crushed and bruised toes and feet.

4. The individual worker must proceed deliberately to use the guards, protective clothing and the standing operating procedure provided for his protection.

5. Both the supervisor and the worker must be constantly alert to identify and to secure correction of hazards that have not previously been recognized. The proper attitude here is vital. A negative attitude, summed up in the "That could hurt somebody" remark without further action, will in time lead to an injury.

6. The safety officer must constantly bring a fresh viewpoint to the problem, whether he is checking a proposed machine or specification for safety or observing an operation on the line.

Accidents that cause amputations are unnecessary. Energetic efforts on the part of all concerned will prevent most of them. Let's make certain our workers retain their fingers.



A HAZARDOUS MATERIAL INDEX

George B. Seeberg, Safety Officer
U.S. Army Southwest Procurement Agency

The control of chemical hazards and the establishment of safe work practices and procedures in environments involving industrial or laboratory compounds are formidable tasks of increasing importance. New and complex commodities are developed and marketed with trade names that are not synonymous with their ingredients. Manufacturers and distributors may inadequately label their products as to their composition, physical properties or health and fire hazards. Identification of injurious or dangerous materials can become more and more difficult. The rapidity with which new and frequently obscure chemicals become available for general use stems from a continuing advance in industrial technology which, from all indications, will maintain its growth and further complicate this area of concern for safety and industrial hygiene personnel.

In an attempt to solve this perplexing problem a system patterned after that used by the University of California, Lawrence Radiation Laboratory, was instituted by this Agency. The basic tools of this system are a form letter, a data sheet, and a 5" X 8" index card. The form letter explains the purpose and reason for the letter and solicits essential information on a voluntary basis. The data sheet which accompanies the letter lists the specific information necessary to analyze and establish accurate and realistic hazard controls.

When the reply to the inquiry is received, pertinent data is entered on the hazardous material index card which then provides a quick and convenient source of relevant facts. The The diamond-shaped diagram adopted by the National Fire Protection Association for hazard identification is printed in the lower right hand corner of this index card and gives at a glance a general idea of the inherent hazards of the chemical and the order of severity of these hazards.

Response from the various manufacturers and distributors has been most encouraging. The vast majority of those to whom inquires were sent have, in the interest of safety, been very cooperative and helpful. The products of those concerns who for one reason or another do not provide toxicological and safe handling information are closely examined before reordering.

This system, although but recently initiated, has demonstrated its value. A number of solutions, cleaners, and solvents which were previously believed to be relatively innocuous have proved to have constituents forming a serious health or fire hazard.

Sample Form Letter

Gentlemen:

Your product(s) _____

are used at this Agency.

We are concerned about physiological effects which may be caused by exposure to the compound(s) and the potential of the material(s) to cause damage to Government equipment and property.

Would you please send to us toxicological and safe handling data. Primarily, we are interested in information on safe work levels, human experience, dangerous reactions, and fire and explosion hazards.

Reports or studies that show these compound(s) will not create a health or safety hazard when handled by our employees would be appreciated.

If you do not have the above information in prepared booklets or forms, please fill out the enclosed data sheet(s) where applicable and return to us.

Sincerely yours,

Safety Officer

1 Incl
as

HAZARDOUS MATERIAL INDEX

TRADE NAME:

MANUFACTURER:

COMPOSITION:

PHYSICAL PROPERTIES:

DECOMPOSITION PRODUCTS:

RECOMMENDED FIRST AID:

HEALTH HAZARDS RATING
T.L.V.: _____ppm; mg/m^3
Rating: ____Extra Hazardous; ____High;
____Moderate; ____Low; ____None
Major Hazard or area of injury:
____Inhalation ____Ingestion
____Skin Irritation ____Skin Absorption
____Eye: irritation; injury
Short exposure tolerance:
_____ppm; mg/m^3; _____hours

FIRE HAZARD
____Extremely flammable; F.P. 0°-20°F-cc,oc
____Flammable; F.P. 20°-80°F-cc,oc
____Combustible; F.P. 80°-200°F-cc,oc
____Minimal; F.P. above 200°F-cc,oc
____Non-Combustible

SP HQ Form 96
1 Apr 67

DATA SHEET FOR TOXICOLOGICAL AND SAFE HANDLING INFORMATION
(Please complete applicable sections)

1. Product name, number, synonym: _____
2. Manufacturer's name: _____
3. Manufacturer's address: _____
4. Chemical and Physical Properties:
   a. Specific gravity (water = 1) _____
   b. Vapor density (air = 1) _____
   c. Vapor pressure mm Hg at 25°C _____
   d. pH _____
   e. Flash point °F: Closed cup _____
      Open Cup _____
      If F.P. changes during evaporation, give data: _____
   f. Explosive limits (% vol. air): Lower _____ Upper _____
   g. May generate spontaneous heating: Yes _____ No _____
   h. Fire Point °F _____; Auto ignition temp. °F _____
   i. What products might be formed in the event of fire or abnormal temperature? _____
   j. Corrosive action on materials such as: aluminum; magnesium; plexiglass; rubber; lacquers; enamels; fabrics; other: _____
   k. Does the material react violently when exposed to air? Water? Heat? Strong oxidizers? Others? _____
   l. Composition (For mixtures or impurities give percentage composition of ingredients):

Compound	Per Cent

NOTE: Please be specific. For example: It is important to know whether or not the alcohol portion contains methanol; the aromatic portion, benzene; the chlorinated portion, carbon tet; etc.

5. Physiological Properties:
   a. Oral toxicity: _____
   b. Effects upon eyes: _____
   c. Effects upon skin: _____
   d. Inhalation hazard: _____
   e. Warning properties (odor, irritation to eyes, nose or throat): _____
   f. Estimated threshold limit value (if not on current list by American Conference of Governmental Industrial Hygienists): _____
6. First Aid Treatment:
   a. Skin contact: _____
   b. Eye contact: _____
   c. Inhalation: _____
   d. Antidote in case of swallowing: _____
7. Precautions for Normal Conditions of Use: _____
8. Recommended Protective Equipment: _____
9. Transportation and Storage Requirements: _____
10. Suitable Fire Extinguishing Agents: _____
11. Handling Precautions in Case of Breakage or Leakage: _____
12. Information furnished by:
    Name: _____
    Title: _____
    Date: _____
    Company: _____
    Address: _____

NOTE: Information in regard to this material's composition will be used only for the purpose of protecting the health and safety of Government employees and the safeguarding of property. The completed form should be mailed to:
(Installation/activity address)

2

SHARPE SAFELY SPEEDS LOADING

Machine power has replaced manpower for safety and speed in container loading into trucks at Sharpe Army Depot, Lathrop, California. A Depot employee devised a loading tool that has taken 2 men out of a potential pinch point and released them for other work. At the same time, congestion on the loading dock has been largely eliminated, and loading time cut to one-sixth of that formerly required.

Loading "Conex" containers into truck vans was a time-consuming job. A Conex container is a metal box 8 1/2 X 7 X 6 feet, weighing up to 10,000 pounds. They are used to ship military hardware overseas. The size of the box is a close fit for a truck van. The weight makes it a job for a large forklift truck.

Standard practice was to load each box from the dock, pushing one after the other until the load of 4 was complete. Then a 2-man crew helped jockey the containers to the front of the van. The entire job took 90 minutes. There was also a pinch-point hazard for the helpers, and the time required resulted in a tieup on the docks, creating other possible hazards.

Leon B. Partain, a crating and packing specialist, observed the sequence of operations and devised the "Conex Loading Pusher Bar." This consists of 2 long steel bars, crossed with a flat plate on the business end. The other end is adapted to the front end of a forklift. The assembly is used to push containers all the way forward in the truck vans. In use, the bar can reach the length of the longest vans.

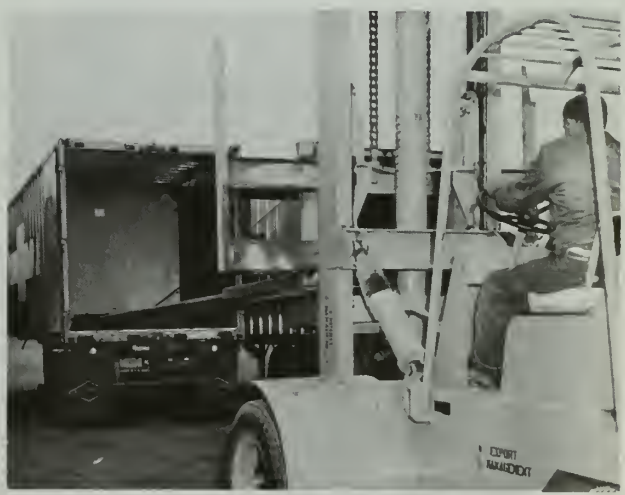
Loading Conex containers now takes 15 minutes for one forklift operator. This can be done anywhere there is room enough to get the pusher bar and forklift behind the van. No loading dock is needed since the forklift can work entirely from the ground level. And the other 2 men are more effectively used elsewhere, having been taken from a potentially hazardous operation.

- Safety Standards, Bureau of Labor Standards, U.S. Department of Labor

(Editor's Note: A similar device is shown in paragraph 4.2.14.24 of TM 743-200.)

PHOTO 1

The Conex loading pusher bar is simple to fabricate and is easily tailored to any need.



PHOTOS 2 and 3

With a smooth even motion, one man pushes a Conex container into a tight fit in the truck van.

FORKLIFT TRUCK OVERHEAD GUARDS FOR LOW CLEARANCES

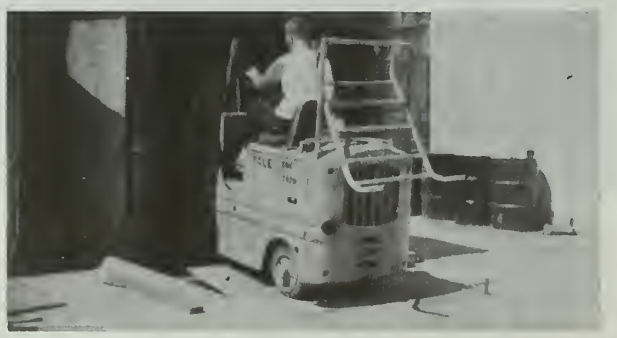
AMC Headquarters' letter, subject: "Overhead Guards - Fork Lift Trucks," dated 17 February 1967, to AMC commands and installations reporting direct to Hq AMC outlined policy for safe operating practices for powered materials handling equipment.

Forklift trucks at AMC installations must be equipped with overhead guards. However, exceptions have been granted where the height of the overhead guard of the forklift truck would prevent entrance into work locations, or the overhead guard would be lower than the top of the operator's head.

Action has been taken to provide an overhead guard to overcome the exception. Until a standard has been established, suitable guards are shown in the photos below. These were extracted from the April 1967 edition of the National Safety News.

Shown in the photos are removable canopy guards which are mounted on forklift trucks that are entering into a transport truck.

Photo 1 at right shows a homemade guard which is manually operated by the operator. When he is about to enter the transport he reaches up and swings the guard over the back of the truck to provide adequate clearance.



Photos 2 and 3 above show a powered guard which is operated by a control on the truck. This guard is commercially available.

PINCH POINT SHIELDED

The Army Missile Command has developed a guard for preventing finger injuries by the blade retaining arm of a shearing machine. An accident led to identification and correction of the hazard.

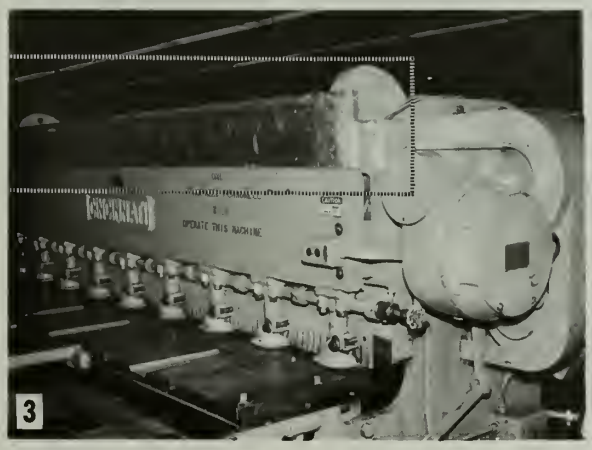
Photo 1 shows how a workman rested his hand on the machine when he turned to speak to another employee. When he turned, the machine control was tripped and the machine functioned.

Photo 2 shows the restricted clearance at the point the employee's hand was resting when the shearing machine reached the bottom of its down stroke. The second finger of the man's hand was crushed and required amputation at the second joint.

A guard was installed across the top front of the shearing machine, as shown in Photo 3. If a worker should now lean against the machine, as shown in Photo 4, his finger would not be exposed to the moving part.

1

2


3

4

SAFETY HARNESS PROTECTS STUDENT CLIMBERS

SP4 Tom Bardeen
U. S. Army Electronic Proving Ground

A new safety device for student pole climbers has been put into use in the wireman's course at the Combat Surveillance School-Training Center, U. S. Army Electronic Proving Ground, Fort Huachuca, Arizona.

For most men, climbing a 30-foot pole causes very little trouble. For a small number of men, the fear of height or a lack of confidence can be defeating and dangerous.

Before beginning his climb, the trainee is fastened into a parachute harness. Two lines are hooked to the harness and run through pulleys that are attached to the crossbar at the top of the pole. The instructors watch the student climb and attend the lines. Should the climber lose his grip, the lines will prevent him from falling and he will sway to and fro, slightly embarrassed, but unhurt. Photos 1 and 2 show the harness and the way it is used.

The system, similar to one used to train bare-back riders in the circus, was developed at Fort Ord, California. The device increases the trainee's confidence and provides him with a greater margin of safety while he is learning.

CURRENT EVENTS....

CLIMB ON TRACTOR TRIGGERS EXPLOSION

An Army civilian employee was providing technical assistance to a unit that was unloading Clark Model 290M tractors from a railway flatcar. All except one machine were moved off. The brakes on this tractor were locked and would not release. The problem was identified as an improper adjustment of the parking brake, which can lock the brakes on this machine.

The employee made an effort to observe the malfunctioning brake system. To do this he had to climb upon the tractor, because the brake linkage was located under the floor board. He stood on the battery box cover, where he could look down to best advantage. The cover yielded under his weight and an explosion followed. Concussion caused his right foot to be fractured and the injury required a 20-day absence from work.

The weight of the employee appeared to have been sufficient to bend the box cover into contact with batteries within the box. This made possible a short circuit or an electric arc, which caused an explosion of hydrogen gas.

The employee was advised of the cause of the explosion and of the need to use a board that would prevent him from bringing his weight to bear on top of the battery box.

CORD CONNECTION MAKES WRONG CONNECTION

A supervisor was connecting an extension cord for use as a temporary power source to a machine in the meat market preparation room of an Army commissary. The cord was 10 feet long, and it had a metal wall outlet as the female connection. The supervisor plugged into an outlet on the wall and ran the cord up the wall and across a pipe near the ceiling. About 4 feet out from the pipe the cord from the machine was plugged into the connection on the end of the extension cord.

After the connection was completed an attempt was made to raise the connected cords out of the way of the workers. The movement disengaged the connection. The metal connection swung on its 4-foot radius and struck the forehead of a woman who was operating a labeling machine.

After the employee recovered from the surprise and momentary pain of the smart blow on her head, neither she nor her supervisor could see any evidence of an injury. No medical attention appeared to be needed and she went ahead with her work.

The woman reported for her duties as usual next morning. She complained of a headache and a lack of balance. Her supervisor sent her for an occupational health examination. No injury was found, but she was referred to a private physician. He diagnosed her case as a slight concussion, and she was sent home. Five days passed before she was allowed to return to work.

Supervisory failure by the immediate supervisor was identified as the primary cause of the accident. Instead of following the safe procedure of requesting professional maintenance service, he attempted to do the work himself and created an unsafe condition.

Supervisors were instructed not to use temporary wiring and to make certain all personnel were moved when overhead work was performed. The temporary wiring in the commissary was removed.

STEPPED UP ACTION LED TO EXPLOSION

An experimental mine was being tested at a proving ground. At the end of the activity for this day, dud high explosives mines were scattered on the ground at 2 test sites. The acting proof officer, a technical representative from an arsenal, and acting branch chief, an ammunition destroyer leader, and an ammunition destroyer discussed the situation. Further tests were to be conducted 3 days later, and the group decided to barricade the area to keep personnel out.

The acting branch chief instructed the civilian gunner to guard the area while the ammunition destroyer leader and the ammunition destroyer brought barricades. The 3 other men left the area. On their way out the acting proof officer told the security guard and the control tower that the area was to be barricaded. Personnel who had no connection with the test were not permitted to enter.

On their way back to the test site with the barricades the ammunition destroyer and his fellow worker discussed the hazard presented by the scattered duds. The mines had been wet when ejected from their containers and dust and dirt had adhered to them. This made them blend with the terrain and very difficult to locate. A gusty wind was now blowing dust. It appeared possible that the shifting dust might completely hide some of the mines before the testing was resumed 3 days later. The 2 men decided this could create a very dangerous condition for the personnel who might then receive an assignment to destroy the mines. They decided the duds should be destroyed without delay.

At the first of the test sites 7 mines were located and destroyed without incident. The men moved to the second site, where 22 to 25 duds were believed to be scattered. They went to work, laying out the detonating cord and attaching leads. While doing this the ammunition destroyer leader failed to detect one mine that blended into the terrain. His foot came into contact with it and the mine detonated. The employee's left foot was severed at the base of the instep.

Investigation revealed the following facts that had bearing on the accident:

1. The project officer for the test had a current standing operating procedure, but he was not present the day of the accident. On the preceding test day when he was present he had not shown the procedure to any of the personnel involved.

2. The standing operating procedure required coordination between the project officer and the safety office before disposition was made of any duds from the test.

3. On the date of the accident the acting proof officer did not have a copy of the standing operating procedure for the test operation.

4. The ammunition destroyer leader and his fellow worker followed a standing operating procedure for an operation with which they were familiar. This provided guidance for destruction of duds from another unit, in which explosive items were scattered over the area and required destruction.

To prevent similar accidents the following practices were put into effect at the installation:

1. All personnel involved in a test operation would be given historical background information, and told of the actions anticipated and the hazards that might be encountered.

2. The standing operating procedure applicable to the item being tested would be used.

3. An effort would be made to destroy items by remote control without exposure of personnel.

RUSH THAT GUARD INSTALLATION!

A cross bar that carried 105mm shell cases became disengaged from a stud on a chain conveyor belt. A contractor employee had the power shut off and made the needed repairs. He then had the power restored, without thinking that his right hand was in a position to be caught by moving machine parts. When the conveyor belt moved his gloved hand was drawn between the conveyor chain and a sprocket wheel. Three fingers were so severely lacerated that he was away from work for 5 days.

To prevent recurrence of the accident the supervisor requested the installation of guards at conveyor areas where the chain belts engaged sprocket wheels.

Four days later another worker was adjusting a carrying bar on a conveyor in a nearby line. The machinery moved and drew his left hand between the conveyor chain and a sprocket wheel. He sustained 2 fractured fingers that caused him to be absent for 5 days.

The supervisor prepared a second accident report. The corrective action section of the form contained the entry: "Guards have been placed at the critical areas (sprocket drive wheels) of conveyors on both line No. 3 and No. 4."

A WARMING WARHEAD BELCHED

A quantity of rejected rocket warheads were being demilitarized and the components, including white phosphorous, were being recovered for reuse. Two munitions operators dressed in protective clothing used a burster pulling press to disassemble the warheads. The burster casing was removed and placed in a water-filled container for disposal. The component that contained the solid state white phosphorous was next removed from the press and placed in a water-filled heating tank. These remained there until the heat changed the phosphorous from a solid to a liquid state which permitted it to be removed by an aspirator.

The operation proceeded until about 40 items had been placed in the tank. The 2 operators discontinued the pulling press operation, and waited for the tank to finish melting the white phosphorous for aspirating.

One operator told the other he was going to the rest room. He turned away from the area of the tank and started to walk past the press. At this moment there was a flash behind him, and smoke filled the area. He turned and heard the other operator cry out in pain. The injured man ran for the safety water tank, immersed himself in it, and began to remove his phosphorous splattered clothing while he remained in the water.

The injured man had been standing close to the heating tank when an underwater eruption occurred. White phosphorous spewed into the air above the tank and into nearby areas. It showered upon the worker, striking him about the head, face, chest, back, and on one knee.

Thermal burns from his burning coveralls covered about 2 percent of his body. An additional 5 percent of his body bore multiple white phosphorous burns. The time he would be away from work was estimated at 3 weeks.

There was no damage to the building and its equipment. The property loss was confined to the white phosphorous belched from one item.

The reason for the eruption in the heat tank was not determined. In the past munitions items heated in the tank had been known to "burp" and small flaming had occurred. There had been no previous splattering of white phosphorous from a belching item.

To prevent any similar injury a shield cover was installed to contain any future eruption that might be caused by uneven heating of white phosphorous shells.

* * * * *

SEAT BELTS AND DAMAGES COLLECTION

In Wisconsin, 2 recent court decisions point up what could be a strong incentive for wearing seat belts -- the danger of being unable to collect damages for injuries sustained in an accident if failure to wear an available seat belt could be considered a contributing factor in the injuries.

In one case, a 12-member jury in a county court held that the plaintiff was more than half to blame for her own injuries, because she neglected to fasten her seat belt. Although the jury awarded her $15,000 in damages, the judge said that this could be reduced by the percentage of her own culpability.

The plaintiff's husband, who was driving the car in which she was riding -- and was also suing for damages -- was held blameless in the accident. He, too, was not using his available seat belt at the time of the accident, but this was held no bar to collection of $6,000 damages awarded him, since recent abdominal surgery had prevented him from a fastening the belt.

In another case, the Wisconsin State Supreme Court decided that failure to use available seat belts could be considered negligence if testimony showed injuries suffered might have been less if belts were worn.

- Traffic Safety, July 67
National Safety Council

HERE'S TO YOUR GOOD HEALTH

T. R. Gooch, Safety Engineer
Thiokol Chemical Corporation, Huntsville Division
U.S. Army Missile Command

Man seems to have 2 things of utmost concern to him -- money and health. To prove which is the most important, you have only to ask a wealthy man who is in poor health. You cannot buy good health at any price. You can protect your good health while you have it.

The purpose of this article is to remind you that good health is a part of being safe. We cannot cover everything but we should motivate further thinking on the subject. Our health has a direct bearing on our mental attitudes and physical ability. Both must be good to prevent accidents.

Here's a recipe for mental and physical health:

1. Take a full days work, mix thoroughly with interest in the job, and skim off pay at regular intervals.

2. Add spice-of-life in off-hours. Use moderate quantities of play and physical exercise, remembering to salt well with common sense. Simmer; do not boil.

3. Strain out worry and discontent, sprinkle with tolerance, and serve with friends at the table. Use as a staple in the diet.

EATING HABITS - Someone has said, "You are what you eat." Watch your eating habits. Be sure you eat a well-balanced diet daily. With a little care and thought, even a box lunch can be adequate and balanced.

OVER INDULGENCE - Moderation is the secret of maintaining good health while enjoying the pleasures of life. If you desire to smoke, drink, or eat rich foods, don't overdo it. Your body has its limitations. A man's pleasure can very well become his misery through over indulgence.

Common sense should also be used in activities involving physical efforts. Exercise and exposure to the elements should be limited to individual abilities.

WORRY - Worry is a disease! It is a menace to your work, your health and your happiness. Worry never helps you solve your problems. They may only be conquered by facing up to them. Worry grows by feeding on itself. Bring your problems out in the open and you'll see they are not as bad as your immagination can make them.

GET SOME REST - Do you know the muscle of the body that gets more rest than any other? It is the heart. Although it never stops working, even when we sleep, it has a built-in trigger that makes it relax completely between beats. This is the one way we can get adequate rest - complete relaxation.

Some people find relaxation in fishing, golfing, or just reading a good book. If one is nervous or suffering from fatigue, he should try different forms of healthful relaxation until he finds the one that suits him. The important thing is to find out what relaxes you best and pursue it often between periods of work.

Sufficient sleep is also essential to adequate rest.

When you get right down to it, your health is entirely your own responsibility. Your employer can do only those things necessary to provide you a healthy place to work. The remainder is up to you.

RADIOACTIVE TABS HELP TO LOCATE TEST MUNITIONS

Test munitions or duds lost from sight in mud, snow, jungle growth or swampland now can be located by instruments which detect a tiny radioactive tab developed at Picatinny Arsenal, Dover, N.J.

A 1-millicurie (one-thousandth of the emanation from one grain of radium) wafer of scandium 46 with a desirable half-life of 85 days is secured to projectiles before firing. The tag is 1/2 inch in diameter and less than .015 inches thick, including its plastic covering.

Army research engineers Ronald Geany and Sam Helf of Picatinny report that instruments developed for this retrieval system can detect a millicurie of the rare-earth element at 100 feet in "free" air. Munitions items submerged in more than a foot of vegetation and water have been detected as much as 30 feet away.

The radioactive strength of the tabs is low enough to allow safe handling over an extended time by experienced personnel. Since development of the recovery technique last year. Picatinny ordnance engineers report 100 percent retrieval of fired items.

It is estimated that as much as 50 percent of munitions scheduled for firing in various environments could be lost if only visual location methods were used.

-Army Research and Development
Newsmagazine 6 June 1967

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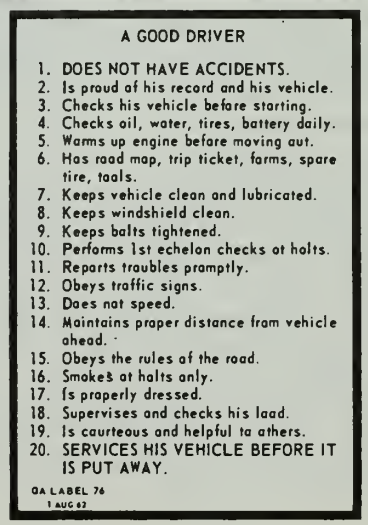
GOOD DRIVER LABEL REQUIRED ON ARMY MOTOR VEHICLES

Paragraph 23 g, AR 746-5, 18 April 1966, Marking and Packing of Supplies and Equipment-Color and Marking of Army Materiel requires that DA Label 76, 1 August 1962 (A Good Driver) will be displayed in all motor vehicles. The label, shown, is intended to promote safe driving practices.


A GOOD DRIVER

1. DOES NOT HAVE ACCIDENTS.
2. Is proud of his record and his vehicle.
3. Checks his vehicle before starting.
4. Checks oil, water, tires, battery daily.
5. Warms up engine before moving out.
6. Has road map, trip ticket, forms, spare tire, tools.
7. Keeps vehicle clean and lubricated.
8. Keeps windshield clean.
9. Keeps bolts tightened.
10. Performs 1st echelon checks at halts.
11. Reports troubles promptly.
12. Obeys traffic signs.
13. Does not speed.
14. Maintains proper distance from vehicle ahead.
15. Obeys the rules of the road.
16. Smokes at halts only.
17. Is properly dressed.
18. Supervises and checks his load.
19. Is courteous and helpful to others.
20. SERVICES HIS VEHICLE BEFORE IT IS PUT AWAY.

DA LABEL 76
1 AUG 62

SAFETY GLASSES SAVE EYE

Mr. Sylvester A. Skoney, an Education Specialist at the Joint Military Packaging Training Center, Aberdeen Proving Ground, has an uninjured right eye, because he wore his safety glasses. Mr. Skoney was struck on his safety glasses by a flying steel staple while he was conducting instruction on the operation of a fiberboard box stapling machine. The staple chipped his right lens, but his safety glasses saved his eye.

SAFETY SHOE PREVENTS INJURY

How a safety shoe with a steel toe bridge prevented serious injury is recounted by John N. Marines, a packer for the Shipping Division at Sacramento Army Depot, to Herman Seevers. Mr. Marines said a "run-away" pallet jack struck his left foot and cut a deep gash in his industrial safety shoe. The shoe saved his toes. The accident occurred when the pallet jack, weighing about 500 pounds and its load also weighing around 500 pounds, went out of control and trapped Mr. Marines' foot. The small photograph shows the approximate position of Mr. Marines' foot when the pallet jack wheel struck it. The wearing of the safety shoe prevented a disabling serious injury and resulted in extensive savings in lost employee time, industrial compensation, hospital expenses and similar outlay.

THE NEW EMPLOYEE AND EXPLOSIVES

J. F. Harbarger - Manager, Safety
Thiokol Chemical Corporation, Huntsville Division
U.S. Army Missile Command

Although solid composite propellant is not spoken of in terms of "explosives," we must still consider it and its ingredients as hazardous materials. There is very little difference in the acceptable safe procedures for handling both, and the line between "explosives" and "propellant" is mighty thin. For this reason, there is no distinction made in this article between "explosives" and "solid propellant."

I have chosen the particular subject in sympathy with my many colleagues in safety management throughout the country who are confronted with the current "step up in operations." The "step up" has been brought about by the demands for more and higher performance weapons, both offensive and defensive, required for contemporary military use. From many years of experience in the field of explosives safety, I know how it feels for the bomb of the bosses' first remarks to explode in your brain: "We have a hot item coming up for production--we'll need several new operators."

Many thoughts regarding safety in connection with the new item buzz through the safety man's mind. He realizes that time is usually at a premium. There must be time for studying the systems drawings, tool design, facility requirements, distances, materials research -- sensitivity tests, explosive classifications, personnel limits. There are variables present in new operations that have been eliminated in the old by experience and time. But, in the new operation only a few people know in the beginning what they want, and often they do not know exactly how to accomplish it. It takes time to develop a safe operation, and usually not much time is available during the early stages of a new operation.

The safety man knows you cannot rush head-on into an explosive operation without following the basic rules set forth for handling explosives. This means personnel must be well trained to handle explosives. It does not necessarily mean each explosive operator should be an expert in the field of explosives safety, but he certainly should be an expert in his area of operation. When the Personnel Department makes an appeal to the local gentry to take up employment in answer to the emergency, you are not likely to get experts right away. There is definitely a safety training problem associated with the hiring of the new employee to handle explosives.

For the purpose of considering the safety training of new employees, I have broken the elements into 5 categories: (1) Selection, (2) Orientation, (3) Job Training, (4) Evaluation Training, and (5) Team Action.

1. Selection of the man is particularly important. His ability must be evaluated carefully. General physical, mental, and emotional acceptabilities may be predetermined by company policies. The Safety Department and the Personnel Department must coordinate closely to assign the man with an apparent deficiency to a work area in which that lack of skill will not seriously affect the company's or his performance.

2. Orientation of the new employee comes first, and a full explanation of the reason and background for the employment should be given. Prime company policies, wage information, basic insurance coverage, general area security, and safety regulations are usually covered. By the time the new employee has gone through the first orientation, he is usually loaded down with pamphlets and hand-outs covering everything from "the cost of living index" to the "bowling league schedule." The new employee is mesmerized by the barrage of information and it takes time for all this information to soak in. The safety man should use the first orientation only to introduce

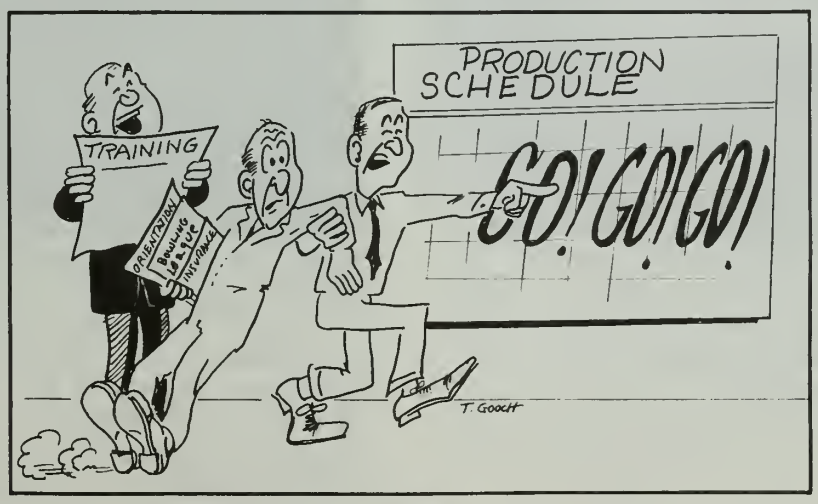
safety to the new employee and to instill in his mind the value of safety. It is more important to use the orientation time to set the new employee in correct perspective with his job than to attempt to use up the time for so-called training. Training should be done on the job.

3. Job Training comes when the new employee is received into the new work group. Specific techniques of the job can be taught by the supervisor with emphasis upon the differences from normal work and work involving explosives. This is the place and the time to get down to explosives safety training. It may be on an individual basis or in groups.

4. Evaluation Training is getting down to specific "things to watch for." After you have "told" the new employee and have "demonstrated" to him how to do the job safely you must follow up on him until you are satisfied he can perform the work safely on his own.

5. Team Action is when a group of people participate in a concerted safety effort to produce the explosive item with a high degree of efficiency and quality. New employees must know their responsibilities from the start and must be encouraged to give their full attention and cooperation for the safety of all from the start. From then on it is a matter of close supervision to insure good results.

If you have the problem of taking on new employees for explosive operations, remember the 5 elements that are recommended. Select the right man, orientate him gently, give him thorough job training, follow up to evaluate his performance, and encourage him to become a member of the team. Now you will have gone a long way toward having a safe explosive operation. But do not let up on close supervision. No matter how thoroughly trained explosive operators may be, close supervision is essential for old and new employees.



METAL FORMING WITH EXPLOSIVES

The pictures on these pages show steps in 2 explosive metal forming projects. These are typical of metal forming projects conducted by the U.S. Army Missile Command in conjunction with the George C. Marshall Space Flight Center.

Photo 1 - The metal used here is aluminum 2219-0, 1/8" X 29" diameter, and 2219-T87, .050" X 29" diameter. The standard practice in explosive forming of bulkhead configurations requires restraint of metal movement in order to overcome the tendency of the metal to buckle or wrinkle while forming.

Photo 2 - This shows a view from above of the die before placement of the metal part that appears separately in Photo 1. The die weighs about 5,000 pounds. Its size is made clearer in the following pictures.

Photo 3 - The metal part has been placed in the die and has been sealed in place with zinc chromate tape.

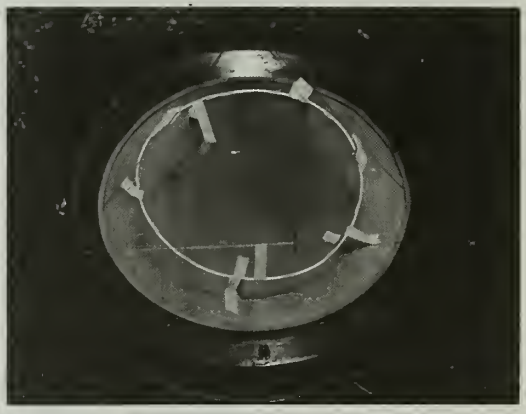


Photo 4 - Approximately 10 feet of 50 grain per foot primacord is used to shape this part. The thin wire shown in this picture is used to maintain the proper distance between the explosive charge and the part. The distance is about 6" in this case.

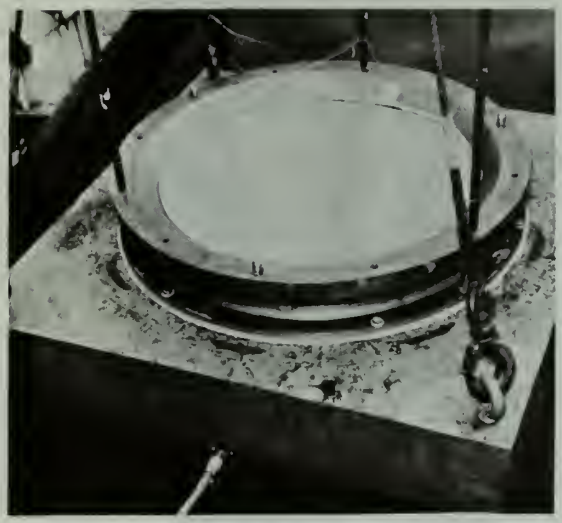


Photo 5 - Electric blasting caps have been attached to the explosive charge. A vacuum line, shown at the bottom of the picture, has been attached to the die. A predetermined vacuum is formed between the part and the die before both are submerged in the water tank.

Photo 6 - Here the die and the part are being lowered into the water tank prior to the explosive metal forming. The machine and other objects in the picture suggest the size of the die and part.

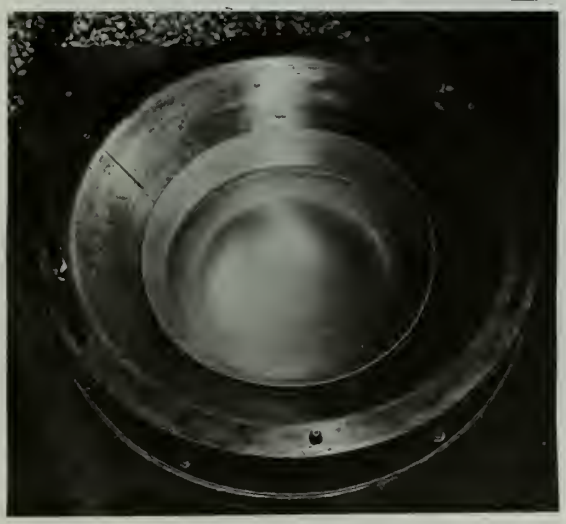


Photo 7 - The part has been formed by exploding the primacord and it is now ready for removal from the die.

Pnoto 8 - This photograph depicts the predetermined desired contour (see A) versus the actual part after the explosive forming. Note the near perfect formation of the part formed in contrast to the desired result.

Photo 9 - This picture shows the appearance of metal parts before and after the explosive metal forming operation.

Photo 10 - This is the first of 3 pictures that show a more complicated shaped part that can be shaped by the explosive metal forming operation. The part that is to be shaped is being fitted into a torus sump die.

Photo 11 - In this picture the shaped part is now ready to be removed from the torus sump die after being formed in a water bath explosive operation.

Photo 12 - This shows the part (left) after it was shaped by the explosive metal forming operation. Before it was shaped the part was a plain tube like the one shown at the right.

RECOGNITION OF PROPELLANT HEAT SOURCES

R. S. Krueger, Safety Engineer
Thiokol Chemical Corporation, Huntsville Division
U.S. Army Missile Command

Each day on the job should be considered another day of training. We have learned from experience that rocket propellant and its ingredients must be handled with respect. Solid rocket motor propellant is made to burn. Solid propellant is made of materials that burn. Therefore in every phase of the making of propellant, extreme precaution must be taken to prevent accidental ignition of the chemicals or materials used.

We know the fire triangle requires 3 things - fuel, oxygen, and heat. We must, therefore, perform our jobs as propellant safety engineers in such a manner that one or more of the fire triangle agents is removed or kept separated from the other.

Since a great deal of solid propellant research and manufacturing work require handling propellant ingredients with properties ready to burn, we must keep heat sources from the ingredients.

To do this, we must recognize the 4 sources of heat: friction, impact, combustion, and electricity.

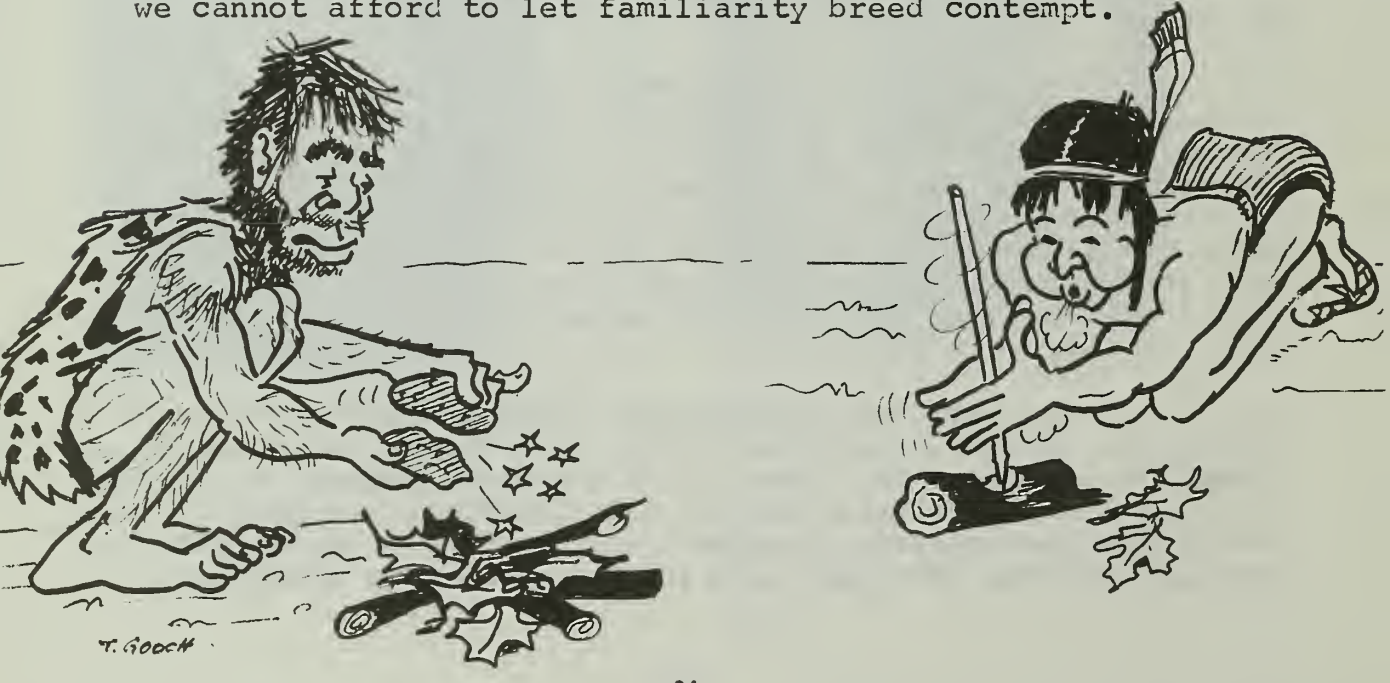
1. Friction heat is produced when 2 objects are rubbed together. This is the greatest potential source of accidental ignition of propellant. Threads rubbing together, machinery, vibration, and mechanical operations generate friction heat. Good housekeeping and close check on equipment to maintain safe standards are the preventive measures to take. Propellant must be kept from these heat sources. Tools must be kept out of possible accidental introduction into mixers.

2. Impact heat is generated when 2 objects strike together. A single blow can cause propellant ignition. Ignition may occur any time a thin layer of propellant is between 2 hard surfaces that strike together. We must avoid surface-to-surface contact and keep propellant from between objects that must be struck together in operation.

3. Heat combustion results from chemical reaction. Some chemicals we use are highly reactive. For this reason, we must be sure of what we handle. What we don't know can cause ignition. Some chemicals react to water, some to other chemicals, or even to air under certain conditions. Great respect for the chemicals and proper techniques of handling applicable material is our way of preventing accidental combustion. Mark and identify all containers. Know and respect the value of safe procedures.

4. Electricity produces heat by the flow of current through a resistance or by a spark discharge. An electric heater is an example of this when the coils heat up. Electric heat is controlled in our operations by automatic devices - thermostats and limitstats. It is our job to see that both are set and functioning properly to insure proper heating limits. Static electricity must be drained from personnel and equipment as it is generated. Where static sensitive materials are handled, flooring should be conductive and personnel should wear conductive shoes. In areas where electrical storms are common, buildings should be protected by approved lightning protection systems. Grounding systems should be properly installed and checked for adequacy at regular intervals.

This has been a review of the things we all have known since the beginning of our work with propellants. In the case of propellants and their properties, the more we learn of their nature, the more clearly we know that we should respect the established hazards. If we are to work safely, we cannot afford to let familiarity breed contempt.



Here are 10 questions that will test your knowledge of safety requirements that you will need under different circumstances. The answers to all of them may be found in AMCR 385-224. How many can you answer without referring to the regulation? The correct answers and references appear on pages 39 and 40.

1. Where explosives, highly flammable or critical materials are involved, a written permit should be required for the temporary use of heat producing equipment producing a temperature higher than what temperature?

   Answer and Reference:

2. When a quantity of acid is to be diluted with water, which substance should be added to which substance?

   Answer and Reference:

3. What protection to buildings is expected from intraline distance?

   Answer and Reference:

4. How close may a motor-driven air compressor be parked to a building in which explosives or ammunition are stored?

   Answer and Reference:

5. What temperature within a magazine that contains explosives makes it necessary to start efforts to cool the magazine?

   Answer and Reference:

6. When a truck is transporting explosive material to a burning or demolition ground, may anyone ride in the cab with the driver?

   Answer and Reference:

7. How close may one moving forklift truck follow another?

   Answer and Reference:

8. When a thorough survey and analysis have revealed the existence of a hazard to operating personnel, should protective clothing be issued immediately?

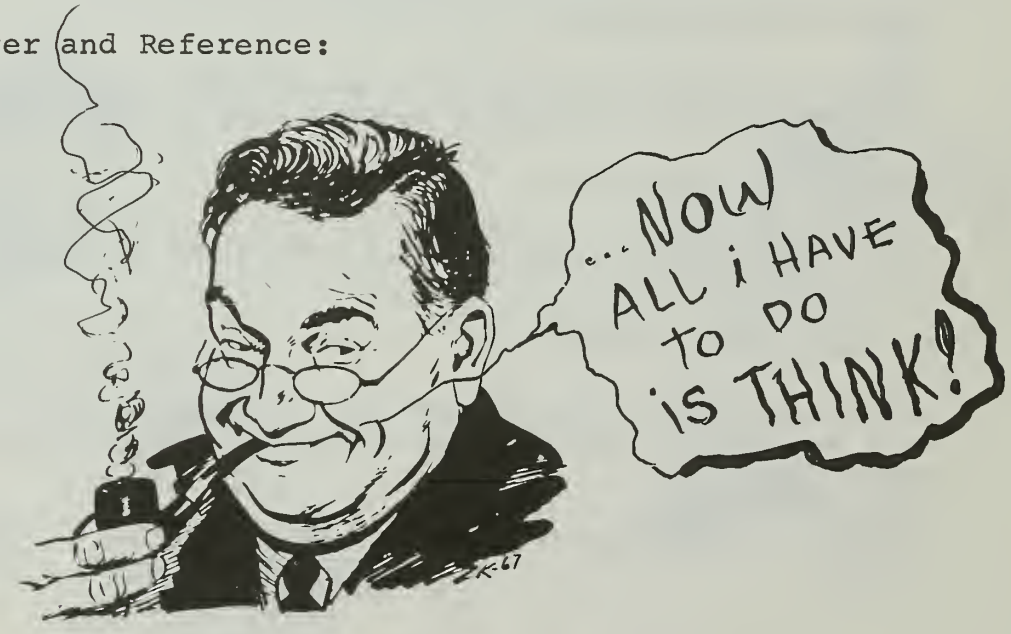
   Answer and Reference:

9. May skylights be used in buildings where ammunition is processed?

   Answer and Reference:

10. If for any reason a press operator finds it necessary to move his hand beneath the ram, what precautions should be taken?

    Answer and Reference:



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AMCR 385-15, 16 May 1967
Safety-Policy and Procedures for Implementation of Peacetime Safety Rules for Nuclear Weapons.

AMCR 385-21, 5 May 1967
Safety-Determination of Ammunition and Explosives Characteristics That Influence Handling, Storage, and Transportation Criteria.

AMCR 420-23, 8 June 1967
Repairs and Utilities-Control of Air and Water Pollution (Reports Control Symbol Budget 1064 and OSD 1330).

DA Circular 385-15, 19 May 1967
Safety-Training for Army Safety Personnel.

DA Circular 385-16, 13 June 1967
Safety-Costs of Accidental Nondisabling, Disabling Nonfatal, and Fatal Injuries to Army Personnel.

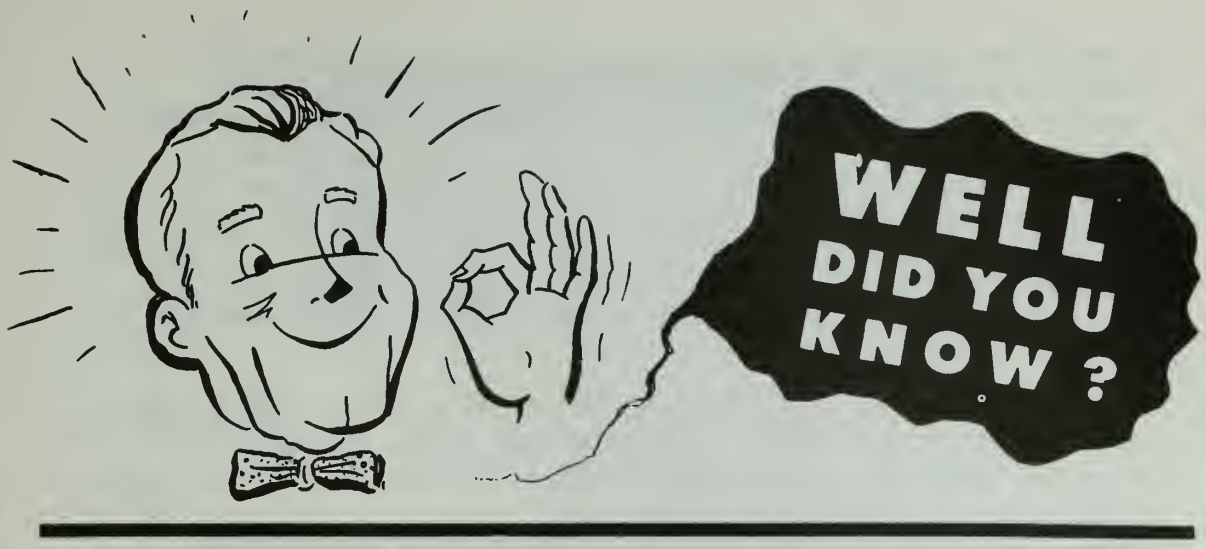
DA Circular 415-6, 31 March 1967
Construction-Minor Construction Projects-Evaluation of Flood Hazards.

DA Circular 700-11, 1 March 1967
Logistics-Smoke Detector Cells Containing Hazardous Quantities of Radioactive Materials.

TB 385-101, 17 January 1967
Safety—Use of Cranes, Crane Shovels, Draglines, and Similar Equipment Near Electric Power Lines.

TB 700-2, 19 May 1967
Explosives Hazard Classification Procedures.

TB 700-5900-1, 6 June 1967
Handling, Storage, Shipping, and Disposal of Surge Voltage Arresters (Spark Gap).



Here are the answers to the questions on pages 35 and 36 All questions were based on information contained in AMCR 385-224. A reference to the pertinent paragraph follows each answer.

1. A written permit should be required for the temporary use of heat-producing equipment that produces a temperature higher than 228°F. (109°C.). Reference: Paragraph 1606.

2. The acid should be added to the water. Reference: Paragraph 1303h.

3. Intraline distance is expected to protect buildings from propagation of explosion due to blast effects but not against the possibility of propagation due to missiles. Buildings separated by intraline distances will probably suffer substantial structural damage. Reference: Paragraph 1705a.

4. The motor-driven air compressor shall be parked at least 50 feet from the magazine that contains explosives or ammunition. Reference: Paragraph 1809e.

5. If the temperature in a magazine exceeds 100°F. for a period of more than 24 hours, the magazine should be cooled. Reference: Paragraph 1805a.

6. Yes. No more than 2 persons shall ride in the cab of a truck while it is being used for this purpose. Reference: Paragraph 2714a.

7. A distance of at least 3 truck lengths shall be maintained between materials handling trucks in operation. Reference: Paragraph 2411a.

8. The first action should be to correct all hazards immediately by operational changes or mechanical guards. If neither of these is feasible, the appropriate personal protective clothing or equipment should then be selected to protect the employee against the hazard. Reference: Paragraph 1002.

9. Skylights should not be used in buildings where explosives or ammunition are processed. Reference: Paragraph 516c.

10. A press operator should not place his hand under the ram unless the machine control has been locked out and the ram blocked. Reference: Paragraph 921.

LETTERKENNY ARMY DEPOT RECEIVES SAFETY AWARD

Letterkenny Army Depot won an AMC Award of Merit for FY 1966. Presentation of the Award was made by Lieutenant General W.B. Bunker (left), Deputy Commander, AMC, to Colonel R.B. Graeves, Depot Commander, and Mr. J.L. Larson, Safety Director. Letterkenny Army Depot also received a National Safety Council Award of Merit for FY 1966

* * *

NATIONAL SAFETY COUNCIL AWARD NOTIFICATIONS

Letterkenny AD has qualified for an NSC Award of Honor for operating 4,600,000 man-hours without a disabling injury from 22 November 1966 to 5 May 1967.

Fort Detrick has won the NSC Award of Merit for accumulating 2,369,318 man-hours without a disabling injury from 18 October 1966 to 17 March 1967.

KNOW YOUR FIRE EXTINGUISHERS

	WATER TYPE				FOAM	CARBON DIOXIDE	DRY CHEMICAL	
	STORED PRESSURE	CARTRIDGE OPERATED	WATER PUMP TANK	SODA ACID	FOAM	CO2	CARTRIDGE OPERATED	STORED PRESSURE
CLASS A FIRES WOOD, PAPER, TRASH HAVING GLOWING EMBERS	YES	YES	YES	YES	YES	NO (BUT WILL CONTROL SMALL SURFACE FIRES)	NO (BUT WILL CONTROL SMALL SURFACE FIRES)	NO (BUT WILL CONTROL SMALL SURFACE FIRES)
CLASS B FIRES FLAMMABLE LIQUIDS, GASOLINE, OIL, PAINTS, GREASE, ETC.	NO	NO	NO	NO	YES	YES	YES	YES
CLASS C FIRES ELECTRICAL EQUIPMENT	NO	NO	NO	NO	NO	YES	YES	YES
CLASS D FIRES COMBUSTIBLE METALS	SPECIAL EXTINGUISHING AGENTS APPROVED BY RECOGNIZED TESTING LABORATORIES							
METHOD OF OPERATION	SQUEEZE HANDLE OR TURN VALVE	TURN UPSIDE DOWN AND BUMP	PUMP HANDLE	TURN UPSIDE DOWN	TURN UPSIDE DOWN	PULL PIN SQUEEZE LEVER	RUPTURE CARTRIDGE-SQUEEZE LEVER	PULL PIN-SQUEEZE LEVER
RANGE	30'–40'	30'–40'	30'–40'	30'–40'	30'–40'	3'–8'	5'–20'	5'–20'
MAINTENANCE	CHECK AIR PRESSURE	WEIGH GAS CARTRIDGE ADD WATER IF REQUIRED	DISCHARGE AND FILL WITH WATER ANNUALLY	DISCHARGE ANNUALLY -RECHARGE	DISCHARGE ANNUALLY -RECHARGE	WEIGH SEMI-ANNUALLY	WEIGH GAS CARTRIDGE-CHECK CONDITION OF DRY CHEMICAL	CHECK PRESSURE GAUGE AND CONDITION OF DRY CHEMICAL

REVISED FIRE EXTINGUISHER CHART

Now Available

THE Bureau of Labor Standards is now able to offer its popular "Know Your Fire Extinguishers" Technical Reference Sheet in an up-to-date revision. This full-color publication can also be used as a 17- by 11-inch poster. The sheet carries pictures of eight different types of fire extinguishers (water—stored pressure, cartridge operated, or pump tank; soda acid; foam; carbon dioxide; and dry chemical, both cartridge operated and stored pressure) and cross refers them to the four fire classes:

"A"—wood or trash.
"B"—flammable liquids.
"C"—electrical equipment.
"D"—combustible metals.

The description of each fire class includes a full-color reproduction of the fire symbol used to mark extinguishers for their intended uses. "YES" and "NO" answers in boldface type clearly set off the limits of each extinguisher. Other brief phrases cover operation, range, and service data.

Single copies are free from the Bureau of Labor Standards, U.S. Department of Labor, Washington, D.C. 20210. Quantity orders should be sent to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Price: 15 cents each, less 25 percent on orders of 100 or more. Ask for "Know Your Fire Extinguishers."

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